

2. The optical semiconductor device according to claim 1, wherein the well layers comprise thin aluminum-indium-gallium-nitride layers and the barrier layers comprise gallium-nitride or aluminum-gallium-nitride layers which are thicker than the well layers and the radiation-active quantum well comprises an indium-gallium-nitride layer.
3. The optical semiconductor device according to claim 1, wherein the radiation-active quantum well follows an uppermost barrier layer.
4. The optical semiconductor device according to claim 1, wherein layer thickness of the radiation-active quantum well is greater than layer thickness of the well layers of the superlattice.
5. The optical semiconductor device according to claim 1, wherein the well layers are thinner than 2 nm and the barrier layers are at least 3 nm thick.
6. The optical semiconductor device according to claim 2, wherein the well layers and barrier layers are doped with silicon.
7. The optical semiconductor device according to claim 6, wherein the dopant concentration is from  $10^{17}$  to  $10^{18} \text{ cm}^{-3}$ .
8. The optical semiconductor device according to claim 1, wherein within at least one well layer of the superlattice, the In content increases in a direction of growth.
9. The optical semiconductor device according to claim 8, wherein in the well layer the indium content, remote from the quantum well layer, lies below 5%.
10. The optical semiconductor device according to patent claim 1, wherein at least one of the well layers of the superlattice has at least one pair of single layers of which a first of the at least one pair, in a direction of growth, has a lower indium content than a second of the at least one pair in a direction of growth.

11. The optical semiconductor device according to claim 10, wherein the second of the at least one pair has an increased indium content of less than 5% of the first of the at least one pair.

920 12. The optical semiconductor device according to claim 10 wherein the well layer comprises a plurality of single layers whose indium content increases from a first of the plurality of single layers lying furthest away from the quantum well layer to a single layer lying closest to the radiation-active quantum well layer.

13. The optical semiconductor device according to claim 12, wherein the indium content increase is smaller than 5%.

14. The optical semiconductor device according to claim 10, wherein the indium content of the first of the at least one pair of single layers is less than 5%.

15. The optical semiconductor device according to claim 10, wherein a thickness of each of the plurality of single layers comprises at least one monolayer.

NE 16. The optical semiconductor device according to claim 10, wherein a thickness of each of the plurality of single layers comprises approximately one monolayer.

NE 17. The optical semiconductor device according to claim 2, wherein the radiation-active quantum well follows an uppermost barrier layer.

NE 18. The optical semiconductor device according to claim 2, wherein layer thickness of the radiation-active quantum well is greater than layer thickness of the well layers of the superlattice.

NE 19. The optical semiconductor device according to claim 2, wherein the well layers are thinner than 2 nm and the barrier layers are at least 3 nm thick.

NE 20. The optical semiconductor device according to claim 3, wherein the well layers and barrier layers are doped with silicon.

- NE 21. The optical semiconductor device according to claim 2, wherein within at least one well layer of the superlattice, the In content increases in a direction of growth.
- NE 22. The optical semiconductor device according to patent claim 2, wherein at least one of the well layers of the superlattice has at least one pair of single layers of which a first of the pair, in a direction of growth, has a lower indium content than a second of the pair in a direction of growth.
- NE 23. The optical semiconductor device according to claim 11 wherein the well layer comprises a plurality of single layers whose indium content increases from a first of the plurality of single layers lying furthest away from the quantum well layer to a single layer lying closest to the radiation-active quantum well layer.
- NE 24. The optical semiconductor device according to claim 11, wherein the indium content of the first of the pair of single layers is less than 5%.
- NE 25. The optical semiconductor device according to claim 11, wherein a thickness of each of the plurality of single layers comprises at least one monolayer.--

**In the Abstract:**

Please replace the paragraph beginning on line 7, page 14, with the following rewritten paragraph:

--An optical semiconductor device with a multiple quantum well structure, is set out in which well layers and barrier layers, comprising various types of semiconductor layers, are alternately layered. The device well layers comprise a first composition based on a nitride semiconductor material with a first electron energy. The barrier layers comprise a second composition of a nitride semiconductor material with electron energy which is higher in comparison to the first electron energy. The well and barrier layers are in the direction of growth, by a radiation-active quantum well layer which with the essentially non-radiating well layers (6a) and the barrier layers (6b), arranged in front, form a superlattice.--

NE Please delete the paragraph of line 22, page 14.